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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/695,252
Filing Date: October 27, 2003
Appellant(s): FAWLEY, NORMAN C.

Jonathan S. Miller
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 08 September 2009 appealing from the Office action mailed 31 March 2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows: The 35 U.S.C. § 103 rejection of Claims 17 and 18 depends from the rejection of claim 1. However, this dependency is not reflected in Appellant's statement of this grounds of rejection. To clarify, the actually grounds of rejection for Claims 17 and 18 is:

> Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US Patent Application Publication No. 2004/0060497 A1) in view of Clavin (US Patent No. 4,132,104) and Lewis (European Patent

Application 1 086 760 A2) as evidenced by Drobny (*Handbook of Thermoplastic Elastomers*, pages 137 and 138) as applied to Claim 1, and further in view of Wolfe et al (US Patent No. 5,435,867).

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,132,104	Clavin, Edward A.	01-1979
4,255,378	Miller, Lee A.	03-1981
5,435,867	Wolfe, Donald H.	07-1995
2004/0060497 A1	Smith, Eric N. et al.	04-2004
EP 1,086,760 A2	Lewis, Donald E.	03-2001

Drobny, Jiri George, *Handbook of Thermoplastic Elastomers*, 2007, William Andrew Publishing, pages 137 and 138

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

Claims 1, 4, 6-10, 17, and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. With respect to Claim 1, the limitation of "placing a heater proximate to a plurality of longitudinally displaced

locations" in line 3 of the Claim is not supported by the Specification as originally filed. Although multiple bends are within the scope of the Claim and within the scope of the Specification as originally filed (see Claim 3 as originally filed and [0010]), the scope of instant Claim 1 includes having multiple heaters, which is not disclosed in the Specification as originally filed. Claims 4, 6-10, 17, and 18 are rejected via their dependency.

Claim Rejections - 35 USC § 103

Claims 1, 4, 6, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US Patent Application Publication No. 2004/0060497 A1) in view of Clavin (US Patent No. 4,132,104) and Lewis (European Patent Application 1 086 760 A2) as evidenced by Drobny (*Handbook of Thermoplastic Elastomers*, pages 137 and 138).

With respect to Claim 1, Smith teaches metal pipe having composite materials which includes fiber, fiberglass, or filaments in a resin (a Composite Reinforced Pipe (CRP); the pipe having a composite reinforcement comprising a resin and reinforcement fibers coupled thereto) (see [0006] and [0015]). Smith teaches that the pipes are bent using induction bending (a method of bending a Composite Reinforced Pipe (CRP)) (see [0015]), which is a process of magnetically exciting metal to produce heat (placing a heater ... along the pipe where the pipe is to be bent; heating a pipe). Causing induction in the metal pipe is a relatively direct source of heat. The composite material is indirectly heated via conduction from the metal pipe and causes the temperature of the composite material to be less than the metal pipe. It is noted that the Claim

language references the pipe and its reinforcement separately, and thus the limitation of heating the pipe and the limitation of heating its reinforcement are separately claimed.

However, Smith does not expressly teach heating the pipe to a temperature above a heat distortion temperature of the resin such that the composite reinforcement is heated to a temperature slightly below a heat distortion temperature of the composite reinforcement.

Clavin teaches applying a material to a pipe (see col. 4, lines 43-59), therefore forming a composite reinforced pipe. The pipe is heated prior to bending, and the pipe is bent (see col. 1, line 57 through col. 2, line 5; fig. 1). Clavin teaches heating to a temperature that the coating is not destroyed and is softened and deformed (the composite reinforcement is heated to a temperature slightly below a heat distortion temperature of the composite reinforcement) (see col. 4, line 43 through col. 5, line 2; particularly col. 4, line 65 through col. 5, line 2). Clavin teaches bending at a location then continuing bending at another location (placing a heater proximate to a plurality of longitudinally displaced locations) (see col. 4, lines 20-42). Clavin teaches twelve-inch diameter pipes (see col. 2, lines 50-55) and bending 1° per arc foot (see col. 5, lines 3-5), which would be 1° of longitudinal length equal to a diameter of the CRP.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat as taught by Clavin in the process of bending as taught by Smith in order to have the reinforcement softened and deformed but not destroyed (below a heat distortion temperature) (see col. 4, line 43 through col. 5, line 2; particularly col. 4, line 65 through col. 5, line 2).

Smith in view of Clavin does not explicitly teach bending with individual bends having ¼ the length of the pipe's diameter.

Lewis teaches achieving cumulative bends with spaced ¼° bends (see col. 9, paragraphs [0029] and col. 10, paragraph [0031]).

In view of Clavin, the spaced ¼° bends would be ¼ of the 1° arc length, and the ¼ of the bend would be spaced ¼ diameter of the pipe (bending the pipe incrementally at the plurality of longitudinally displaced locations, the longitudinally displaced locations separated by a distance equal to approximately ¼ of the diameter of the pipe).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lewis's bend increments with Smith's pipe bending because Lewis teaches that ¼° bends can incrementally achieve the larger overall arc desired to be obtained (see Lewis, col. 9, paragraph [0029] and col. 10, paragraph [0031]).

Since induction heating is used, the metal would be heated more by the induction as evidenced by Drobny (*Handbook of Thermoplastic Elastomers*, paragraph bridging pages 137 and 138). Thus, the temperature of the pipe would be higher than the composite (heating the pipe to a temperature above a heat distortion temperature of the resin).

With respect to Claim 4, Clavin teaches twelve-inch diameter pipes (see col. 2, lines 50-55) and bending 1° per arc foot (see col. 5, lines 3-5). Thus, a total bend of 1° in an arc foot with a twelve-inch diameter pipe (1° of longitudinal length equal to a diameter of the CRP).

With respect to Claim 6, Smith in view of Clavin teaches making a CRP as previously described with 1° bends achieved in the arc distance equal to the pipe's diameter.

Smith in view of Clavin does not explicitly teach bending with individual bends having ¼ the length of the pipe's diameter.

Lewis teaches achieving cumulative bends with spaced ¼° bends (wherein the pipe is bent 1/4° at each location) (see col. 9, paragraphs [0029] and col. 10, paragraph [0031]).

With respect to Claim 7, the pipe is preheated to apply the coating (preheating the pipe) before heating to bend (preheating before heating) (see col. 4, lines 43-65).

With respect to Claim 9, Smith teaches using induction heating (see [0006]).

Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US Patent Application Publication No. 2004/0060497 A1) in view of Clavin (US Patent No. 4,132,104) and Lewis (European Patent Application 1 086 760 A2) as evidenced by Drobny (*Handbook of Thermoplastic Elastomers*, pages 137 and 138) as applied to Claim 1 above, and further in view of Miller et al. (US Patent No. 4,255,378).

With respect to Claim 8, Smith in view of Clavin teaches making a CRP as previously described.

Smith in view of Clavin does not explicitly teach capping the ends of the pipe.

Miller et al. teach capping the ends of a pipe to be bent (see col. 5, lines 22-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Miller's caps with Smith's bending in order to prevent the wall from buckling up upon formation of the curve (see col. 5, lines 22-29).

With respect to Claim 10, Miller's heating of the tube creates hot air in the tube (introducing hot air into the CRP) (see col. 5, lines 22-29).

Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US Patent Application Publication No. 2004/0060497 A1) in view of Clavin (US Patent No. 4,132,104) and Lewis (European Patent Application 1 086 760 A2) as evidenced by Drobny (*Handbook of Thermoplastic Elastomers*, pages 137 and 138) as applied to Claim 1 above, and further in view of Wolfe et al (US Patent No. 5,435,867).

With respect to Claim 17, Smith teaches bending composite reinforced metal pipe, but does not expressly teach that the composite's fibers are positioned circumferentially and longitudinally along the pipe (see [0006]).

Wolfe teaches that in order to strengthen a fiber reinforced pipe, the fibers are longitudinal-oriented and circumferential-oriented fiber (see col. 2, line 59 through col. 3, line 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use fibers that are longitudinal-oriented and circumferential-oriented as taught by Wolfe in the composite reinforced pipe of Smith in order to provide diversity in the pipe's strength (see col. 2, line 59 through col. 3, line 2 and col. 3, line 56 through col. 4, line 16).

With respect to Claim 18, Smith in view of Clavin and Wolfe do not appear to explicitly teach that the number of longitudinal fibers is greater than the number of circumferential fibers.

However, in this regard, Wolfe teaches optimizing the direction of fibers to strengthen in particular directions (see col. 3, line 56 through col. 4, line 16). As such, Wolfe recognizes that the ratio of longitudinal fibers to the circumferential fibers is a result-effective variable. Since the ratio of longitudinal fibers to the circumferential fibers is a result-effective variable, one of ordinary skill in the art would have obviously been motivated to determine the optimum ratio applied in the process of Smith in view of Clavin and Wolfe through routine experimentation based upon increasing strength in the longitudinal direction.

(10) Response to Argument

In Appellant's Arguments section VII(G), pages 6 and 7, Appellant argues that a person of ordinary skill in the art would not reasonably interpret Claims 1, 4, 6-10, 17, and 18 as having multiple heaters since a reasonable interpretation of Claim 1 is that "a single heater may be large enough to be proximate to multiple longitudinally displaced locations" (see page 7, second full paragraph). In response, the Examiner notes that the claim language rejected under 35 U.S.C. § 112, first paragraph, as being unsupported is "placing a heater proximate to a plurality of longitudinally spaced locations." As recited above, this is due to the limitation's scope being beyond the scope of Appellant's Specification as originally filed. Thus, Appellant's example that "a single heater may be large enough to be proximate to multiple longitudinally displaced

locations" is an additional example of the limitation's scope being beyond the scope of Appellant's Specification as originally filed.

In Appellant's Arguments section VII(G), pages 7 and 8, Appellant argues that Claim 1 could be reasonably interpreted to include, and does not preclude, a step for moving the pipe or the heater such that multiple locations longitudinally displaced are heated. In response, the Examiner agrees that moving a heater for multiple bends is within the scope of the Claim 1 and within the scope of the Specification as originally filed (see Claim 3 as originally filed and [0010]). However, Claim 1 may also be interpreted as having multiple heaters, which is not disclosed in the Specification as originally filed and necessitates a 35 U.S.C. § 112, first paragraph, rejection. Therefore, discussion of an interpretation of Claim 1's limitations that is supported is moot.

In Appellant's Arguments section VII(H)(1)(a), pages 9 and 10, Appellant argues that Claim 1's limitation of bending the pipe incrementally and at distances equal to ¼ of the diameter of the pipe. Specifically, Appellant argues that Clavin only has 1° bends spaced at distances equal to the diameter of the pipe, and Appellant argues that Lewis only makes bends through cumulative ¼° bends. In response, the Examiner relies upon the combination of the two teachings to support the obviousness of Claim 1's bending; Lewis's cumulative ¼° bends would provide for Clavin's 1° bend, and thus the Clavin's bend spaced at a distance equal to the diameter of the pipe would be spaced among the cumulative ¼° bends, which would be ¼ of the diameter of the pipe. Appellent's argument that motivation to combine has not been established does not address the motivation for using Lewis's bend increments in Smith's pipes as cited above in Section

(9) Grounds of Rejection and as cited on page 4 of the Office Action mailed 31 March 2009:

> It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lewis's bend increments with Smith's pipe bending because Lewis teaches that ¼° bends can incrementally achieve the larger overall arc desired to be obtained (see Lewis, col. 9, paragraph [0029] and col. 10, paragraph [0031]).

Moreover, in response to Appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In Appellant's Arguments section VII(H)(3)(a), pages 11 and 12, Appellant argues that Claim 17's limitation of reinforcement fibers positioned circumferentially is not met because it would not have been obvious to one of ordinary skill in the art at the time the invention was made to use them because Wolfe teaches that use with a non-static, or bent, pipe is problematic. In response, the Examiner first notes that Wolfe teaches the claimed limitation that the fibers are longitudinal-oriented and circumferential-oriented (see col. 2, line 59 through col. 3, line 2), which Appellant appears to acknowledge. Thus, Wolfe may be relied upon for all that is taught since disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. *In re Susi*, 169 USPQ 423 (CCPA 1971). Second, Wolfe's

acknowledgements of the considerations of bending (see Wolfe, col. 2, lines 15-20) are simply considerations of how the benefits of bending and reinforcement may be obtained—providing diversity in the pipe's strength (see Wolfe, col. 2, line 59 through col. 3, line 2 and col. 3, line 56 through col. 4, line 16)—while maintaining structural integrity of the pipe during construction and use. Alternatively stated, the reason for combining would outweigh secondary considerations. This is further supported by Wolfe's details on how the considerations may be addressed to be ameliorated.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Patrick Butler/

Examiner, Art Unit 1791

Conferees:

/Christina Johnson/

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